Omnitron Systems Technology, Inc.

***i*Converter™ Redundant Fast Ethernet Module**

User Manual

***i*Converter Tx/2Fx** Dual Fiber Modules				
Fiber Type	**Distance**	**Connector Type**		
		ST	**SC**	**LC**
MM	5km	8420-0	8422-0	-
SM	30km	8421-1	8423-1	8427-1
SM	60km	8421-2	8423-2	8427-2
SM	120km	-	8423-3	-

***i*Converter Tx/2Fx SF** Single-Fiber Modules			
Fiber / Connector Type	**Distance**	**Tx: 1310 nm, Rx: 1550 nm**	**Tx: 1550 nm, Rx: 1310 nm**
SM / SC	20 km	8430-1	8431-1
SM / SC	40 km	8430-2	8432-2

***i*Converter Tx/2Tx**	
Distance	**RJ-45 UTP Connector**
100m	8400-0

For wide temperature (-40 to 60º C), add a "W" to the end of the model number. Consult factory for extended temperature (-40 to +75º C) models.
When using single-fiber (SF) media converter models, the Tx wavelength on one end has to match the Rx wavelength on the other.

OVERVIEW:

The *iConverter* Redundant Fast Ethernet manageable media converters are members of the modular *iConverter* product family. The following models are described:

Tx/2Fx 100BASE-TX UTP to dual 100BASE-FX dual fiber

Tx/2Fx SF 100BASE-TX UTP to dual 100BASE-FX single-fiber

Tx/2Tx 100BASE-TX UTP to dual 100BASE-FX UTP

The *iConverter* Redundant Fast Ethernet modules are intended for use in networks that require fiber or copper link redundancy. During normal operations Port A is the active primary and Port B is the backup secondary. When loss of link on Port A is detected, the module automatically switches to transmitting on Port B. With a switch over time of less than 100 microseconds, these modules provide the rapid response time required for ultra critical applications. Note: After the link is switched, there will be a 5 second delay before that link can been reestablished.

APPLICATION EXAMPLES:

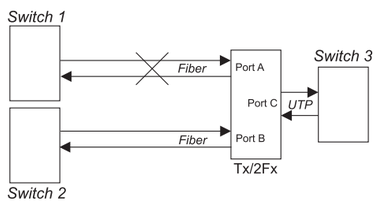

Fig. 1 Redundant Switch Example

In this example, redundant Switches 1 and 2 are connected to Switch 3 via a Tx/2Fx converter. If power fails in Switch 1, or if there is a loss of link in the fiber cable, the Tx/2Fx converter switches to transmitting on port B and routes data flow to Switch 2.

MOUNTING AND CABLE ATTACHMENT:

iConverter modules are hot-swappable and can be installed into any chassis in the *iConverter* family.

1. Carefully slide the *iConverter* module into the installation slot, aligning the module with the installation guides. NOTE: Ensure that module is firmly seated against the backplane.
2. Secure the module by securing the panel fastener screw (attached to module) to chassis front.
3. Attach the UTP port of Port C via a category 5 cable to a 100BASE-TX Ethernet device.
4. *iConverter* Redundant Fast Ethernet Modules should be deployed in pairs with Port A linked to Port A and Port B linked to Port B between the two modules. If using *iConverter* Redundant Fast Ethernet Modules with redundant Fx or Fx SF ports, attach Port A fiber ports and Port B fiber ports of the two modules via an appropriate multimode or single-mode fiber cable. The *iConverter* transmit (Tx) must attach to the receive side on other device; the receive (Rx) must attach to the transmit. If using *iConverter* Redundant Fast Ethernet Modules with redundant Tx ports, attach the UTP ports of the two modules' Port A via a category 5 cable and UTP ports of the two modules' Port B via a category 5 cable.
5. Single fiber (SF) media converter models must be deployed in pairs so that the transmission (Tx) and reception (Rx) wavelengths of the single-mode (SM) ports communicating over a fiber must match the reception (Rx) and transmission (Tx) at the opposite end. For example, an 8430-1 should be connected to an 8431-1.

LED INDICATORS:

LED	Color	Description
Power:	Yellow	On--Power
Port A Link:	Green	On--Link / Blink--activity Steady Blink--Standby mode
Port B Link:	Green	On--Link / Blink--activity Steady Blink--Standby mode
Port C Link:	Green	On--Link / Blink--activity
Port A Select:	Green	On--Active port / Blink--remote side broken
Port B Select:	Green	On--Active port / Blink--remote side broken
UTP Auto:	Green	On--Auto-Negotiation enabled
UTP FDx:	Green	On--Full-Duplex detected

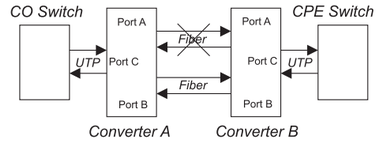

Fig. 2 Redundant Fiber to Customer

In this example, data flow from a core switch at the Central Office is converted from UTP to redundant fiber, and converted back to UTP, where it is connected to an edge switch at the Customer Premises. If there is a loss of link in fiber Port A, the Tx/2Fx converter switches to transmitting on fiber Port B, without a service disruption to the mission-critical customer.

LINK MODES:

In order to accommodate different user needs, the Redundant *iConverters* support four different linking modes.

NOTE that it is recommended keeping the Redundant *iConverters* in the factory default Link Segment (LS) setting.

In "Link Segment" (LS), sometimes referred to as the "Normal" mode, a port transmits a "Link" signal independently of any received "Link" at any other port. For example, the UTP transmits a "Link" regardless of either fiber receiving a "Link" [Fig 3(a) & (b)]. Figure 3(a) shows the state when all links are functioning correctly. Port A LEDs indicate link and activity, while the Port B LEDs blink at one Hertz to indicate they are not active, but are in "Standby". Figure 3(b) shows that when the fiber link to Port A is broken, Port B becomes active.

In "Link Propagate" (LP), sometimes referred to as "Link Loss Carry Forward", a port transmits a "Link" signal only when receiving a "Link" at its other port. For example, the UTP transmits a "Link" only when receiving a "Link" at both fiber ports (Not Shown).

REDUNDANT FIBER SPECIFICATIONS:

Model Type	**Tx/2Fx**	**Tx/2Tx**
Protocols	100BASE-FX, 100BASE-TX	100BASE-TX
Primary Connectors	RJ-45	RJ-45
Redundant Connectors	SC, ST, LC Single-Fiber SC	RJ-45
Controls	UTP X-over, LS/LP, RFD, SFD, UTP Auto/Man, FDX/HDX	UTP X-over, LS/LP, RFD, SFD, UTP Auto/Man, FDX/HDX
LED Displays	Power, FO link, UTP link, Select, Auto, FDX/HDX	Power, UTP link, UTP link, Select, Auto, FDX/HDX
Dimensions	W:0.85" x D:4.5" x H:2.8"	
Weight	8 oz.	
Compliance	UL, CE, FCC Class A	
Power Requirement (typical)	0.7A @ 3.3VDC	1.1A @ 3.3VDC
Temperature	Standard: 0 to 50º C Wide: -40 to 60º C Storage: -40 to 80º C	
Humidity	5 to 95% (non-condensing)	
Altitude	-100m to 4000m	
MTBF (hrs)	520, 000	

In "Remote Fault Detection" (RFD), the UTP port transmits a "Link" signal only when receiving a "Link" at both the fiber ports. The fiber port transmits a "Link" only when receiving "Link" signals both at the fiber port and the UTP port. As a result, fiber faults (no "Link" received at the fiber) are looped-back and can be reported to the network's core (Not Shown).

In "Symmetrical Fault Detection" (SFD), the UTP port transmits a "Link" signal only when receiving a "Link" at both the fiber ports. The fiber port transmits a "Link" only when receiving "Link" signal from both the fiber ports and the UTP port. As a result, fiber faults (no "Link" received at the fiber) are looped back and can be reported to the network core. In addition, connecting two back-to-back converters which are both set to SFD facilitates dual-loop-back where fiber faults are reported to both ends of the network (Not Shown).

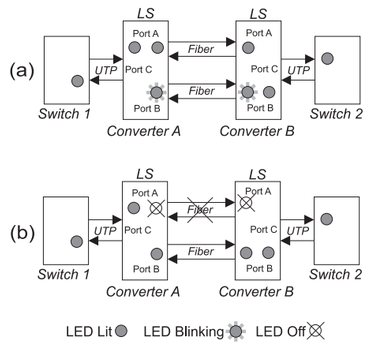

Fig. 3 Link Modes

Warning

The operating description in this Instruction Manual is for use by qualified personnel only. To avoid electrical shock, do not perform any servicing of this unit other than that contained in the operating instructions, unless you are qualified and certified to do so by Omnitron Systems Technology, Inc.

Warranty

This product is warranted to the original purchaser against defects in material and workmanship for a period of TWO YEARS from the date of shipment. A LIFETIME warranty may be obtained by the original purchaser by REGISTERING this product with Omnitron within 90 days from the date of shipment. TO REGISTER, COMPLETE AND MAIL OR FAX THE ENCLOSED REGISTRATION FORM. Or you may register your product on the Internet at www.omnitron-systems.com. During the warranty period, Omnitron will, at its option, repair or replace a product which is proven to be defective.
For warranty service, the product must be sent to an Omnitron designated facility, at Buyer's expense. Omnitron will pay the shipping charge to return the product to Buyer's designated US address using Omnitron's standard shipping method.

Limitation of Warranty

The foregoing warranty shall not apply to defects resulting from improper or inadequate use and/or maintenance of the equipment by Buyer, Buyer-supplied equipment, Buyer-supplied interfacing, unauthorized modifications or tampering with equipment (including removal of equipment cover by personnel not specifically authorized and certified by Omnitron), or misuse, or operating outside the environmental specification of the product (including but not limited to voltage, ambient temperature, radiation, unusual dust, etc.), or improper site preparation or maintenance.

No other warranty is expressed or implied. Omnitron specifically disclaims the implied warranties of merchantability and fitness for any particular purpose.

BOARD MOUNTED DIP-SWITCH SETTINGS:

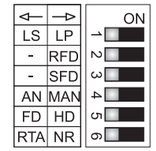

Fig. 4 Board Mounted DIP-Switches

Link Segment/Propagate "LS/LP" DIP-Switch:

This DIP-Switch enables the Link Segment "LS" or Link Propagate "LP" modes. When in the "LS" position (left, factory default), Link Segment mode is enabled. In the "LP" or "ON" position (right), Link Propagate mode is enabled.

Note that for "LS" mode, "LP", "RFD" and "SFD", DIP-Switches must be in the Left position (factory setting).

Note that setting more than one of the mode switches ("LP", "RFD" or "SFD") to the Right position on the same module is an illegal mode that will result in unpredictable behavior.

Remote Fault Detection "RFD" DIP-Switch:

When in the "RFD" position, the Remote Fault Detection mode is enabled.

Note that connecting two converters with both set to RFD mode is illegal and will cause a "deadly embrace" lockup.

Symmetrical Fault Detection "SFD" DIP-Switch:

When this DIP-Switch is in the "SFD" position (right), the Symmetrical Fault Detection mode is enabled. Note that when a loss of "Link" occurs between two Redundant Fast Ethernet modules, both redundant connections must have a loss of incoming "Link" signal in order for this to occur.

UTP Auto/Manual "AN/MAN" DIP-Switch:

When this DIP-Switch is set to Auto Negotiate "AN" (factory setting) it enables the UTP Port to determine duplex mode automatically. If the connected device cannot provide the proper signal to indicate its own mode of operation, this DIP-Switch should be set to Manual "MAN". This feature allows connections with devices that do not auto negotiate properly.

UTP Full/Half-Duplex "FD/HD" DIP-Switch:

When the UTP Auto/Manual DIP-Switch is in Manual "MAN" position (described above), the UTP Full/Half-Duplex "FD/HD" DIP-Switch determines the duplex operation mode for the UTP port. When set to Full-Duplex "FD" (factory setting), the UTP port operates in Full-Duplex. When set to Half- Duplex "HD" the UTP port operates in Half-Duplex. Adjust the Half/Full-Duplex DIP-Switch to match the connecting device and check for link status.

Return to Port A "RTA/NR" DIP-Switch:

When this DIP-Switch is in the Return to Port A "RTA" position (factory default), link reestablishment on Port A immediately returns data transmission to Port A after a link failure in the connection between the A ports. Even though the switch over time is less than 100 milliseconds, there is the possibility of lost data (dropped packet) when the Return to Port A "RTA" DIP-Switch setting is selected. When the switch is set to Not Return to A "NR", Port B continues to be used for transmitting data even after link has been reestablished on Port A.

Note that modules connected together must be set to the same mode for correct operation.

RJ45 Crossover "= / X" Switch (Not Shown):

When connecting the UTP to a hub or switch, set switch to Straight-Through "=" (factory setting). When connecting to a workstation, set to Crossover "X".

Exclusive Remedies

The remedies provided herein are the Buyer's sole and exclusive remedies. Omnitron shall not be liable for any direct, indirect, special, incidental, or consequential damages, whether based on contract, tort, or any legal theory.

Technical Support:

For help with this product, contact our Technical Support:

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Form: 040-08400-001E 12/12